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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/517,705	03/02/2000	Chunlin Liang	042390.P5771D	4202

7590 10/21/2004

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EXAMINER	
LOKE, STEVEN HO YIN	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/517,705	LIANG ET AL.	
	Examiner	Art Unit	
	Steven Loke	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,16-18,20 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,16-18 and 20* is/are rejected.

7)☒ Claim(s) *21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 16, 18 and 20 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Komatsu.

In regards to claim 1, Komatsu shows all the elements of the claimed invention in fig. 6D. It is a circuit device, comprising: a first transistor (nMOS) including a first metal gate electrode (n+ type WSi_x) [5na] over a first gate dielectric [4] on a first area of a semiconductor substrate [1], the first metal gate electrode comprising a first metal layer (n+ type WSi_x) in direct contact with the first gate dielectric and having a work function corresponding to the work function of N-type silicon; and a second transistor (pMOS) complementary to the first transistor including a second metal gate electrode (p-type WSi_x) [5pa] over a second gate dielectric [4] on a second different area of a semiconductor substrate [1], the second metal gate electrode comprising a second metal layer (p-type WSi_x), the second metal layer having a work function corresponding to the work function of P-type silicon, wherein the first metal gate electrode and the second metal gate electrode each separately disposed in respective ones of the first area and the second area of the semiconductor substrate, and wherein the first metal layer and second metal layer comprise the same type of metal (W).

In regards to claim 16, Komatsu further discloses the first gate dielectric is silicon dioxide.

In regards to claim 18, Komatsu shows all the elements of the claimed invention in fig. 6D. It is a circuit device, comprising: a first transistor (pMOS) including a first gate electrode (p-type WSi_x) [5pa] over a first gate dielectric [4] on a first area of a semiconductor substrate [1], the first gate electrode comprising a first metal layer (p-type WSi_x) in direct contact with the first gate dielectric and having a Fermi level corresponding to the work function of P-type silicon; and a second transistor (nMOS) complementary to the first transistor including a second gate electrode (n+ type WSi_x) [5na] over a second gate dielectric [4] on a second different area of a semiconductor substrate [1], the second gate electrode comprising a second metal layer (n+ type WSi_x), the second metal layer having a work function corresponding to the work function of N-type silicon, wherein the first gate electrode and the second gate electrode each separately disposed in respective ones of the first area and the second area of the semiconductor substrate, and wherein the first metal layer and second metal layer are formed from a same initial metal layer ([5i] (WSi_x) of fig. 6A).

In regards to claim 20, Komatsu further discloses the first gate dielectric is silicon dioxide.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komatsu.

In regards to claims 17, Komatsu discloses other known high-melting metal silicide layer can be used as a gate electrode material (col. 13, lines 52-55).

Komatsu differs from the claimed invention by not showing the first metal gate electrode is molybdenum silicide.

It would have been obvious for the first metal gate electrode is molybdenum silicide because it is a well known high-melting metal silicide material.

5. Claim 21 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: The major difference in the claims not found in the prior art of record is the first gate electrode is one of tantalum nitride and molybdenum nitride.

7. Applicant's arguments with respect to claims 1, 16-18, 20 and 21 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (571) 272-1657. The examiner can normally be reached on 7:50 am to 5:20 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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October 17, 2004

Steven Loke
Primary Examiner